WE CLAIM

1. A method for decoding a packet transmitted over a channel, the packet including a plurality of samples, said method comprising:

generating a first set of soft estimates of bits based upon a computation of a first feed-forward filter and a first feedback filter as a function of an estimate of the channel; and

generating a second set of soft estimates of bits based upon a computation of a second feed-forward filter and a second feedback filter as a function of a first set of soft symbol estimates.

2. The method of claim 1, further comprising:

generating a set of hard estimates of bits based upon a computation of a third feed-forward filter and a third feedback filter as a function of a second set of soft symbol estimates.

3. A device for decoding a packet transmitted over a channel, the packet including a plurality of samples, said device comprising:

means for generating a first set of soft estimates of bits based upon a computation of a first feed-forward filter and a first feedback filter as a function of an estimate of the channel; and

means for generating a second set of soft estimates of bits based upon a computation of a second feed-forward filter and a second feedback filter as a function of a first set of soft symbol estimates.

4. The device of claim 3, further comprising:

means for generating a set of hard estimates of bits based upon a computation of a third feed-forward filter and a third feedback filter as a function of a second set of soft symbol estimates.

5. A method for decoding a packet transmitted over a channel, the packet including a plurality of samples, said method comprising:

providing a first set of soft symbol estimates; and

computing a first feed-forward filter and a first feedback filter as a function of the first set of soft symbol estimates.

6. The method of claim 5, wherein the first feed-forward filter and the first feedback filter are computed according to:

$$\mathbf{x} = \begin{bmatrix} \mathbf{y}(i) \\ \hat{\mathbf{s}}_{\delta}^{(n)}(i) \end{bmatrix}$$

$$\begin{bmatrix} \mathbf{f}^{(n)} \\ \mathbf{b}^{(n)} \end{bmatrix} = \mathbf{R}_{\mathbf{xx}}^{-1}\mathbf{R}_{\mathbf{x}\hat{s}^{(n)}}, \quad \text{where}$$

$$\mathbf{R}_{\mathbf{xx}} = \sum_{i=0}^{M-1} \mathbf{x}(i)\mathbf{x}^{H}(i)$$

$$\mathbf{R}_{\mathbf{x}\hat{s}^{(n)}} = \sum_{i=0}^{M-1} \mathbf{x}(i)\left(\hat{s}^{(n)}(i)\right)^{*}$$

7. The method of claim 5, further comprising:

filtering the plurality of samples through the first feed-forward filter; and

filtering the first set of soft symbol estimates through the first feedback filter.

8. The method of claim 7, further comprising:

providing a first set of decision feedback equalization outputs in response to a filtering of the plurality of samples through the first feed-forward filter and a filtering of the first set of soft symbol estimates through the first feedback filter.

9. The method of claim 8, wherein the a first set of decision feedback equalization outputs are computed according to:

$$z^{(n)}(i) = \left(\mathbf{f}^{(n)}\right)^H \mathbf{y}(i) + \left(\mathbf{b}^{(n)}\right)^H \hat{\mathbf{s}}^{(n)}(i)$$

10. The method of claim 8, further comprising:

providing a second set of soft symbol estimates; and

computing a second feed-forward filter and a second feedback filter as a function of the second set of soft symbol estimates.

11. The method of claim 10, further comprising:

filtering the plurality of samples through the second feed-forward filter; and

filtering the second set of soft symbol estimates through the second feedback filter.

12. The method of claim 11, further comprising:

providing a second set of decision feedback equalization outputs in response to a filtering of the plurality of samples through the second feed-forward filter and a filtering of the second set of soft symbol estimates through the second feedback filter.

13. A device for decoding a packet transmitted over a channel, the packet including a plurality of samples, said device comprising:

a soft symbol estimator providing a first set of soft symbol estimates in response to a reception of the packet by said device;

a first feed-forward filter computed as a function of the first set of soft symbol estimates; and

a first feedback filter computed as a function of the first set of soft symbol estimates.

14. The device of claim 13, wherein said first feed-forward filter and said first feedback filter are computed according to:

$$\mathbf{x} = \begin{bmatrix} \mathbf{y}(i) \\ \hat{\mathbf{s}}_{\delta}^{(n)}(i) \end{bmatrix}$$

$$\begin{bmatrix} \mathbf{f}^{(n)} \\ \mathbf{b}^{(n)} \end{bmatrix} = \mathbf{R}_{\mathbf{xx}}^{-1}\mathbf{R}_{\mathbf{x}\hat{s}^{(n)}}, \quad \text{where}$$

$$\mathbf{R}_{\mathbf{xx}} = \sum_{i=0}^{M-1} \mathbf{x}(i)\mathbf{x}^{H}(i)$$

$$\mathbf{R}_{\mathbf{x}\hat{s}^{(n)}} = \sum_{i=0}^{M-1} \mathbf{x}(i)\left(\hat{s}^{(n)}(i)\right)^{*}$$

15. The device of claim 13, wherein

said first feed-forward filters the plurality of samples upon a computation of said first feed-forward filter; and

said feedback filter filters the first set of soft symbol estimates upon a computation of said first feedback filter.

16. The device of claim 15, further comprising:

an adder providing a first set of decision feedback equalization outputs in response to a filtering of the plurality of sample through said first feed-forward filter and a filtering of the first set of soft symbol estimates through said first feedback filter.

17. The device of claim 16, wherein the a first set of decision feedback equalization outputs are computed in according to:

$$z^{(n)}(i) = \left(\mathbf{f}^{(n)}\right)^{H}\mathbf{y}(i) + \left(\mathbf{b}^{(n)}\right)^{H}\hat{\mathbf{s}}^{(n)}(i)$$

18. The device of claim 16, further comprising:

a second feed-forward filter computed as a function of a second set of soft symbol estimates; and

a second feedback filter computed as a function of the second set of soft symbol estimates,

wherein said soft symbol estimator provides the second set of soft symbol estimates in response to said adder providing said first output signal.

19. The device of claim 18, wherein:

said second feed-forward filters the plurality of samples upon a computation of said second feed-forward filter; and

said second feedback filter filters the second set of soft symbol estimates upon a computation of said second feedback filter.

20. The device of claim 19, wherein

said adder further provides a second set of decision feedback equalization outputs in response to a filtering of the plurality of samples through said second feed-forward filter and a filtering of the second set of soft symbol estimates through said second feedback filter.

21. A computer readable medium storing a computer program comprising:

computer readable code for generating a first set of soft estimates of a plurality of bits based upon a computation of a first feed-forward filter and a first feedback filter as a function of an estimate of a channel; and

computer readable code for generating a second set of soft estimates of the plurality of bits based upon a computation of a second feed-forward filter and a second feedback filter as a function of a first set of soft symbol estimates.

22. The computer readable medium of claim 21, further comprising:

computer readable code for generating a set of hard estimates of the plurality of bits based upon a computation of a third feed-forward filter and a third feedback filter as a function of a second set of soft symbol estimates.

23. A computer readable medium storing a computer program comprising:

computer readable code for providing a first set of soft symbol estimates; and

computer readable code for computing a first feed-forward filter and a first feedback filter as a function of the first set of soft symbol estimates.

24. The computer readable medium of claim 23, wherein the first feed-forward filter and the first feedback filter are computed according to:

$$\mathbf{x} = \begin{bmatrix} \mathbf{y}(i) \\ \hat{\mathbf{s}}_{\delta}^{(n)}(i) \end{bmatrix}$$

$$\begin{bmatrix} \mathbf{f}^{(n)} \\ \mathbf{b}^{(n)} \end{bmatrix} = \mathbf{R}_{\mathbf{xx}}^{-1}\mathbf{R}_{\mathbf{x}\hat{s}^{(n)}}, \quad \text{where}$$

$$\mathbf{R}_{\mathbf{xx}} = \sum_{i=0}^{M-1} \mathbf{x}(i)\mathbf{x}^{H}(i)$$

$$\mathbf{R}_{\mathbf{x}\hat{s}^{(n)}} = \sum_{i=0}^{M-1} \mathbf{x}(i)\left(\hat{s}^{(n)}(i)\right)^{*}$$

25. The computer readable medium of claim 24, further comprising:

computer readable code for filtering the plurality of samples through the first feed-forward filter; and

computer readable code for filtering the first set of soft symbol estimates through the first feedback filter.

26. The computer readable medium of claim 25, further comprising:

computer readable code for providing a first set of decision feedback equalization outputs in response to a filtering of the plurality of samples through the first feed-forward filter and a filtering of the first set of soft symbol estimates through the first feedback filter.

27. The computer readable medium of claim 26, wherein the a first set of decision feedback equalization outputs are computed according to:

$$z^{(n)}(i) = \left(\mathbf{f}^{(n)}\right)^H \mathbf{y}(i) + \left(\mathbf{b}^{(n)}\right)^H \hat{\mathbf{s}}^{(n)}(i)$$

28. The computer readable medium of claim 26, further comprising:

computer readable code for providing a second set of soft symbol estimates; and

computer readable code for computing a second feed-forward filter and a second feedback filter as a function of the second set of soft symbol estimates.

29. The computer readable medium of claim 28, further comprising:

computer readable code for filtering the plurality of samples through the second feed-forward filter; and

computer readable code for filtering the second set of soft symbol estimates through the second feedback filter.

30. The computer readable medium of claim 29, further comprising:

computer readable code for providing a second set of decision feedback equalization outputs in response to a filtering of the plurality of samples through the second feed-forward filter and a filtering of the second set of soft symbol estimates through the second feedback filter.